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ACTIVITIES OF THE ORGANIZATIONS OF THE UNITED NATIONS SYSTEM IN THE FIELD OF WATER AND MINERAL RESOURCES, AND INTER-AGENCY COORDINATION

Activities of the organizations of the United Nations system and inter-agency coordination in the field of water resources

Report of the Secretary-General

SUMMARY

The present report provides a general overview of the activities of the organizations of the United Nations system in the field of water resources in the context of the recommendations contained in chapter 18 of Agenda 21. 1/ It also deals with activities concerning disaster prevention and mitigation in the field of water resources. For each programme area, this report provides a general overview of activities and a discussion of questions related to coordination and cooperation.

The report points out that there has been a significant evolution in the concept of coordination and cooperation since the United Nations Water Conference held in 1977, together with a growing understanding of the need to bring about concerted approaches and policies, particularly with regard to the development of a holistic approach to land and water resources development. The report emphasizes the need for continued consultations among the organizations concerned, and for fuller participation by the regional commissions in those consultations.

* E/C.7/1994/1.

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INTRODUCTION

1. The present report provides an overview of the activities of United Nations organizations in the field of water resources in the context of the recommendations contained in the seven programme areas of chapter 18 of Agenda 21, 1/ namely, integrated water resources development and management; water resources assessment; protection of water resources, water quality and aquatic ecosystems; drinking-water supply and sanitation; water and sustainable urban development; water for sustainable food production and rural development; and impacts of climate change on water resources. In addition, this report deals with activities concerning disaster prevention and mitigation in the field of water resources, an issue not directly addressed in Agenda 21 as a distinct programme area.

2. For each programme area, this report provides a general overview of activities and a discussion of questions related to coordination and cooperation in the implementation of activities within that programme area. Detailed descriptions of activities from the various organizations concerned will be available to the Committee on National Resources through individual presentations in the form either of background documents or of oral presentations.

I. INTEGRATED WATER RESOURCES DEVELOPMENT AND MANAGEMENT

A. Overview of activities

3. The Department for Development Support and Management Services of the United Nations Secretariat, the World Bank, the United Nations Development Programme (UNDP) and the United Nations Environment Programme (UNEP) had been given the lead role within the Administrative Committee on Coordination (ACC) Subcommittee on Water Resources in developing strategies for accelerating progress in the area of integrated water resources development and management, prior to the United Nations Conference on Environment and Development, and subsequently within the context of implementing Agenda 21.

4. In the case of UNDP, a capacity-building approach was defined in 1991, aimed at creating an enabling environment for integrated water resources management, strengthening institutions and human resources development, and increasing public participation. This approach was further refined during the International Conference on Water and the Environment, held in Dublin in January 1992, and at the United Nations Conference on Environment and Development, and made operational through a series of water sector assessments, carried out by the Department for Development Support and Management Services of the United Nations Secretariat in cooperation with the World Bank.

5. In the meantime, the World Bank had decided that for integrated water resources development and management to become a reality, a change in Bank policy would be required. The culmination of this decision was the publication, in 1993, of Water Resources Management - A World Bank Policy Paper. 2/ An essential component of the World Bank's efforts to make the policy operational

is the production of a guide for developing the water resources management strategy. The first part of strategy formulation is water sector assessment, aiming at a full examination of factors that influence the development of water resources, including the examination and evaluation of development options.

6. The Department for Development Support and Management Services of the United Nations Secretariat together with UNDP has been assisting this process by carrying out a number of pilot sector assessments or diagnostic studies in countries such as Yemen, Morocco, India, Nepal, Peru and Bolivia. Further work is envisaged in China, the countries of the Southern African Development Community (SADC), Papua New Guinea and Madagascar. The approach has been found to be most useful in formulating UNDP country programmes in the context of national development plans and priorities, particularly in the context of capacity-building.

7. The next phase will involve a programme of capacity-building for integrated water resources management, using the experience gained so far. The Food and Agriculture Organization of the United Nations (FAO) has carried out a number of sector assessments under the International Action Programme on Water and Sustainable Agricultural Development. These will also be taken into account in the review as well as any water sector assessments carried out by other bilateral or multilateral aid agencies.

8. Another initiative in this area concerns the collaboration of the Department for Development Support and Management Services of the United Nations Secretariat and UNEP, with the close support of UNDP and the World Bank, in launching the Freshwater Consultative Forum. It is intended that this forum unfold as a continuing process of communication among water resources management specialists from developing and developed countries through which experiences in river basin and lake basin development and management can be shared.

9. At an organizational meeting held in Geneva in November 1992, participants felt that the time was ripe for a re-examination of existing concepts of river basin development, in the light of Agenda 21, with a view to preparing guidelines or principles for improving and accelerating integrated river basin development. During the Third Meeting of the Working Group on Water Resources of the Multilateral Middle East Peace Process, which was held in Geneva from 27 to 29 April 1993, it was requested that the Forum should discuss issues relevant to the Middle East, and that it become an inter-sessional activity of the multilateral peace process. At that time, it was also suggested that the issue of scale should be discussed.

10. The first Freshwater Consultative Forum took place from 13 to 16 December 1993 at the International Academy of the Environment in Geneva. It was attended by 43 participants from different regions of the world, including the Middle East. One of the important conclusions of the Forum was that UNEP and UNDP should choose an existing river or lake basin organization with a critical need where the various recommendations for improving water resources management could be applied. These would include greater public participation and innovative public awareness measures using public information media. Assistance would also be given to raising financial resources for implementing

the agreed-upon action programme. The two organizations were called upon to report back to the Forum at the next session, to be held in 1994.

11. Another major development in the field of integrated water resources development and management has been the emergence of macroeconomic-based, multi-objective planning models; these have been successfully developed, tested and applied in the UNDP-financed, Department for Development Support and Management Services-executed North China Water Management Project which concluded in November 1993. Interactive computer models from the North China Water Management Project were demonstrated at a training workshop held in Beijing from 1 to 3 November 1993, immediately following the Fourth Meeting of the Working Group on Water Resources of the Multilateral Middle East Peace Process.

12. The integrated management of water resources in small islands, including preparedness for disasters such as typhoons and floods, has been an important thrust of the work of the Department for Development Support and Management Services of the United Nations Secretariat in its operational activities for many years. Projects are now concentrated in small islands of the South Pacific.

13. As for the regional commissions, the Economic Commission for Africa (ECA) in collaboration with the Organization of African Unity finalized a Protocol in Natural Resources including Water Resources Development in Africa. In 1993, ECA prepared a comprehensive study on problems, prospects and strategies for cooperation among riparian countries for the integrated water resources development of the Nile River basin, and published a detailed study on the conservation and rational use of water resources in six North African countries. For the biennium 1994-1995, the Commission is planning to organize an ad hoc expert group meeting on policies and strategies for the development of natural resources and energy in Africa, and a regional seminar on the sustainable development of natural resources, including water.

14. The Economic Commission for Europe (ECE) was instrumental in the development and adoption of the Convention on the Protection and Use of Transboundary Watercourses and International Lakes, adopted in Helsinki on 17 March 1992 by the EEC's Senior Advisers to ECE Governments on Environmental and Water Problems, and signed by 25 countries and by the European Community before the period of signature closed on 18 September 1992. ECE has also prepared a review of national strategies and policies for the protection and use of transboundary waters and is working on the development of instruments to promote the ecosystem approach to sustainable water management.

15. The Economic Commission for Latin America and the Caribbean (ECLAC) has prepared a number of reports on the subject of integrated water resources management and acts as the secretariat of the Latin American and Caribbean Network for Integrated Water Management, which consists of institutions dealing with this question. The first meeting of the Network was held in Santiago in November 1993. It also organizes courses on water resources management in various countries of the region. The Economic and Social Commission for Asia and the Pacific (ESCAP) organized, in 1991, a regional Workshop on Sustainable Development, and prepared papers on the integrated approach to the efficient

development, management and use of water resources. The Economic and Social Commission for Western Asia (ESCWA) convened a Symposium on Water Use and Conservation in November 1993.

16. Even though it is clear that women have an important role to play in the management of water resources, this important dimension has mostly been neglected in the past. In this regard, the International Research and Training Institute for the Advancement of Women (INSTRAW) has been instrumental in bringing to the fore the need for the greater involvement of women in the development and management process. This has been most evident in the case of drinking-water supply and sanitation, where INSTRAW, in cooperation with the Department for Development Support and Management Services and the International Labour Organization (ILO), developed multimedia training packages on women, and water supply and sanitation, and provides the chair for the inter-agency Task Force on Women. Regional seminars, funded by the Department for Development Support and Management Services, for testing the revised modules, were carried out in Africa (the Gambia, September 1991) and in Asia (Bangkok, September 1992). In the broader context of water resources development and management, INSTRAW acts as the focal point for gender issues.

B. Coordination of activities

17. Much work remains to be done in order to bring about a system-wide coherent approach to integrated water resources management. The adoption by the World Bank of a policy paper on water resources, along with other activities enumerated above, provides a strong basis for future work. In this regard, the Seminar on Water Resources Management convened by the World Bank from 7 to 9 December 1993 provided a useful vehicle for a dialogue on the subject. The Seminar was attended by participants from some of the Bank's borrowing countries, and by representatives from external support agencies and from some organizations of the United Nations system.

18. The ACC Subcommittee on Water Resources, and more specifically its working group on water resources management, provides the mechanism for coordination. The task force should now be in a position to embark on a course of action designed to bring the organizations of the system to the point of adopting generally accepted approaches. In view of the ongoing process of decentralization, the regional commissions will be called upon to play an important role in this field. In the past, the commissions have not been able to participate in a consistent manner in the work of the Subcommittee or of its task forces, owing mostly to budgetary constraints. Their future participation in the work of the Subcommittee will be important, particularly in reference to this programme area.

19. Coordinated efforts continue within the organizations of the United Nations system with regard to the establishment of an integrated information network with a view to assessing the state of the freshwater resources of the world. In this regard, a meeting of the ACC Subcommittee's task force on information management was convened at World Meteorological Organization (WMO) headquarters in July 1993, with a view to taking further steps to achieve this objective. As far as the availability of information is concerned, there are significant gaps,

particularly with regard to statistics on water resources use, the interrelationships between population, land and water, and the impact of the application of economic and legal instruments on water resources use and pollution control. Additional efforts are needed in this regard and the role to be played by various organizations, including the regional commissions, needs to be studied.

II. WATER RESOURCES ASSESSMENT AND IMPACTS OF CLIMATE CHANGE ON WATER RESOURCES

A. Overview of activities

1. Water resources assessment

20. Water resources assessment activities have continued to occupy a major place in United Nations Educational, Scientific and Cultural Organization (UNESCO) programmes and in WMO programmes designed to support national hydrologic services, institutions dealing with research, training and education in hydrology, and bodies with allied roles. The Fourth UNESCO/WMO/International Council of Scientific Unions (ICSU) Conference on Hydrology, held in Paris from 22 to 27 March 1993, highlighted those programmes, particularly the International Hydrological Programme of UNESCO, and the Operational Hydrology Programme of WMO, and the parts played in them by developing and developed countries. The Conference agreed to the Paris Statement with five recommendations, including one to achieve even closer partnership between the two agency programmes at national and international levels.

21. One expression of the partnership between UNESCO and WMO was the publication, in 1993, of the first edition of the UNESCO/WMO Water Resource Assessment Activities - Handbook for National Evaluation, which allows national bodies to assess their capabilities in water resources assessment. The second edition will place greater emphasis on water quality, groundwater and other aspects of water resources assessment not dealt with adequately in the first edition.

22. Since the publication of the WMO/UNESCO report on water resources assessment in 1991, 3/ the two agencies have kept abreast of the performance of national hydrologic services and their competence as expressed by their data-collection networks, their computer facilities for the storage and analysis of those data, and the products that they have developed for users. Staffing levels and their education and training have also been considered. Many services continue to suffer a decline in all of these areas of work, most recently and most severely in the newly independent nations of the former Union of Soviet Socialist Republics (USSR) and in the countries of Eastern Europe.

23. The Department for Development Support and Management Services of the United Nations Secretariat and WMO have participated in the activities of the Steering Committee of the World Bank/UNDP project on Sub-Saharan Hydrological Assessment in Africa, jointly financed by UNDP, the World Bank, the African Development Bank, the European Economic Community (EEC) and French bilateral contributions. The aim of the project is to diagnose the gaps in hydrologic and

hydrogeologic monitoring networks and to assess the institutional capabilities of the region.

24. To counter the decline in the capability of national hydrologic services, WMO and UNESCO, with the support of the World Bank, have proposed a World Hydrological Cycle Observation System (WHYCOS), consisting of an initial network of about 1,000 stations worldwide sited on the world's largest rivers, for measuring flow, load and on-bank climatic and atmospheric variables in order to monitor the environment. Many of those stations already exist, mostly in the developed world. Where they are absent or not properly equipped, it is the intention that external funds be used to install them or bring them up to the level of the other stations in the network, as well as to carry out other appropriate capacity-building measures for the service concerned. Those stations would all be connected by Data-Collection Platforms and satellites and through appropriate segments of the Global Telecommunication System of the WMO World Weather Watch to a series of databases.

25. Because the decline in hydrologic services is particularly serious in Africa, WMO and UNESCO, with the support of the World Bank, have made detailed proposals, to extend over a period of 20 years, for WHYCOS-Africa. A 100-station initial network is planned, with each station recording 15 or more variables for transmission by Meteosat (a series of satellites) to national and international centres. In stage one of WHYCOS-Africa, a small team of experts would be set up to install the network with staff of the national hydrologic services; and that staff would be trained to use the network and develop archives and products. That stage would cost approximately 15 million dollars spread over six years. However, despite approaches to a range of sources of funding, no funds have yet been made available to the agencies concerned. The WHYCOS principle is also proposed for application to the Aral Sea.

26. Transfer of hydrologic technology through the ongoing WMO technology transfer system known as the Hydrological Operational Multipurpose Subprogramme (HOMS) has continued. Many of the components deal with water resources assessment, but some, such as those for the design of flood forecasting systems, are highly relevant to disaster mitigation and the International Decade for Natural Disaster Reduction. Since HOMS commenced in 1981, nearly 3,000 transfers of technology have been undertaken, the majority from North to South, but with some North-North and some South-South.

2. Impacts of climatic change on water resources

27. While uncertainty remains about future climate at global, regional and smaller scales, there is no uncertainty that water resources will suffer more severely from climate change than any other sector and that these effects will in turn have impact on other sectors, for example, agriculture and energy. Higher temperatures worldwide and the higher evaporation rates they will bring, coupled with lower precipitation, are expected to lead to a reduction in world water resources. Where water resources were already under stress, this would cause further problems as requirements for water reached or exceeded supplies. However, in some regions precipitation will increase, while decreases are likely elsewhere. Changes in any of these characteristics would be highly significant

for water resources, especially for the occurrence of the extremes of flood and drought.

28. Those changes are likely to be exacerbated where sealevel rise poses a threat to low-lying areas, particularly in the case of small islands. In this regard, it is expected that sealevel rise would endanger coastal groundwater resources through saline intrusion, especially in small islands where the recharge area was reduced. Changes in rainfall amount, duration and seasonal distribution may adversely affect groundwater recharge and rainwater harvesting for small islands. In addition, increases in frequency and severity of tropical cyclones, hurricanes and typhoons may result from higher sea-surface temperatures with a consequent increase in storm damage and flooding reinforced by sealevel rise. In small islands higher temperatures would result in increases in demand for water for public supply, agriculture and other uses, and those increases would be superimposed on increases due to the expected rise in population.

29. As a result of the decline in the ability of national bodies to monitor and process hydrologic data, their ability to respond to adverse future effects has also declined. The proposed World Hydrological Cycle Observation System (WHYCOS) will offer the opportunity to overcome some of these problems, particularly on a global scale. However, a more detailed project that concentrates on the hydrologic regime of several sets of small islands situated in different climatic regimes is needed. WMO has been involved in initial proposals for such a project, and it also convened a workshop in Trinidad and Tobago from 5 to 9 July 1993 (with UNEP, WHO and UNESCO) that dealt with water-quality issues in small islands.

30. Such a project would improve monitoring, and develop techniques and methods for assessing the effects of climate change on water resources and related social, economic and environmental effects. The project would allow Governments to develop and initiate suitable response strategies.

31. Through the World Climate Programme-Water (WCP-Water), WMO, UNESCO, UNEP and FAO, with the participation of non-governmental organizations, national institutes and bodies, address the problem of climate change and water resources. WCP-Water brings together some 30 projects, where studies are under way on a wide range of issues. In one of these projects, long-time series of river flows from more than 200 sites around the world were analysed for changes and trends. While some of these records showed evidence of changes that were statistically significant, others showed no change. Additional work to expand the sample and to undertake further tests is under way.

32. At the regional level, ECLAC, in November 1993, convened a regional expert meeting on "Possible effects of climate change on water resources in Latin America and the Caribbean".

B. Coordination of activities

33. Recent years have witnessed increasing cooperation among organizations with regards to water resources assessment, as illustrated by the cooperation between the World Bank, WMO, UNESCO, UNEP and the Department for Development Support and Management Services of the United Nations Secretariat with regard to the strengthening of hydrologic networks. Increased coordination is also taking place with regard to the linking of the quantitative assessment of water resources with the monitoring of water quality. A good deal of cooperation with non-governmental organizations in this field of endeavour also exists.

34. In addition to previously described programmes that are concerned specifically with the strengthening of hydrologic networks in developing countries and economies in transition, certain assessment-related activities in the context of development projects are being carried out by a number of organizations, notably the Department for Development Support and Management Services of the United Nations Secretariat, the World Bank and UNEP, in order to provide data that are needed for the planning and management of water resources and not otherwise available. The incorporation of such efforts into a comprehensive approach to data management at the national level is essential.

35. As expressed in the report of the Secretary-General concerning progress in the implementation of the Mar del Plata Action Plan 4/ and of Agenda 21 on water-related issues (E/C.7/1994/4), it is felt that the ability of Governments to strengthen their hydrologic services hinges on the recognition given to their importance within the overall water resources management process. Consequently, at both the national and international levels, there is a need to strengthen the linkages of specific activities of the organizations into a holistic approach to water resources development.

36. Because of the role of the regional commissions with regard to the promotion, within the context of Agenda 21, of integrated management concepts in their respective regions, those commissions can be instrumental in sounding a note of alarm as to the seriousness of prevailing conditions and in enhancing the recognition of the importance of water resources assessment as a cornerstone for water resources management. The commissions could also play a helpful role in the collection and analysis of information concerning hydrologic networks within WMO's Hydrological Information Referral Service (INFOHYDRO) programme.

III. PROTECTION OF WATER RESOURCES, WATER QUALITY AND AQUATIC ECOSYSTEMS

A. Overview of activities

37. A number of organizations of the United Nations system are involved in this programme area as a result of the wide range of activities related to it, including water resources, water quality and aquatic ecosystems. UNEP is co-sponsoring a number of programmes that relate directly to water-quality protection. One is the Global Water Quality Monitoring Programme (GEMS/WATER), the other is the International Union for Conservation of Nature and Natural Resources (IUCN) which deals with ecological aspects of water resources.

38. The linkage with health protection objectives is maintained by the World Health Organization (WHO) through the GEMS/WATER programme, but also through its work on water pollution control. The activities to protect drinking-water quality contribute directly to the protection of the quality of surface water and groundwaters, particularly those used for urban water-supplies. The disease control and eradication programmes of WHO, notably those for diarrhoeal diseases, guinea worm, schistosomiasis and river blindness, as well as the Joint WHO/FAO/UNEP/United Nations Centre for Human Settlements (Habitat) Panel of Experts on Environmental Management for Disease Vector Control (PEEM), have a crucial impact on the way in which water resources are being managed. The hydrologic aspects are dealt with by two programmes, the International Hydrological Programme (IHP) at UNESCO and the Operational Hydrology Programme (OHP) at WMO. IHP not only covers research on water resource protection but also collaborates with the Programme on Man and the Biosphere (MAB) on ecological issues. OHP, through its Global Run-off Data Centre, provides the hydrologic information needed to manage water quality effectively.

39. In addition to global programmes and organizations, there are a number of regional organizations that contribute significantly to water resources and quality protection. A noteworthy contribution in this regard is the previously mentioned ECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes. ECE's Senior Advisers to ECE Governments on Environmental and Water Problems are in the process of preparing a status report and policy recommendations on the prevention, control and reduction of pollution from point sources. Practices that promote the reduction of inputs of nutrients and hazardous substances from diffuse substances are also being reviewed. In addition, ECE has developed water-quality criteria for natural water sources and their ecological state. The Global Environment Facility (GEF)-supported programme for the Danube River basin will be one of the first beneficiaries thereof. The UNEP regional offices play an important political role in bringing countries together on water pollution issues. WHO and UNESCO have regional offices with important operational roles in programme planning and implementation.

40. Water-quality monitoring services have been supported in a number of countries in Latin America, Africa and Asia through training of laboratory staff, provision of computer equipment and quality-control services. Twinning arrangements between collaborating centres in developed countries and national and regional laboratories in developing countries were established for this purpose.

41. A contribution to integrated water resources management has been made through water pollution assessment and pollution control advisory services in several international river basins. Examples are those of the equatorial lakes and upper Nile, the Zambezi, the Mekong and the Rio de la Plata. In addition, national hydrologic institutions were assisted in their efforts to also deal with water-quality problems. To this end, water authorities in the Caribbean were brought together to propose regional activities and to provide an input into the United Nations initiative on small island States.

42. Advances in the protection of human health from the contamination of water sources have been made through the revision of the WHO Guidelines for Drinking-

Water Quality which will provide the basis for regulatory action on pollution control; and the prevalence of water-associated diseases has been further reduced by intensive campaigns for guinea worm eradication in the affected countries. River blindness in the Volta valley has been reduced to the point where villagers can return to their farms.

43. The protection of groundwater is receiving growing attention and collaborating centres have been nominated by WHO for this purpose. Training is being given to national water resource managers in Latin America, and region-wide studies were launched in the Pacific region. Pilot studies on the aquifers underlying urban areas were completed in several regions.

44. The assessment of water quality as a prerequisite of management has been launched in the Asian and Pacific region and throughout the territory of the former Soviet Union. These are follow-ups to the assessment studies undertaken in preparation for the United Nations Conference on Environment and Development and in verification of the Mar del Plata Action Plan. Early-warning approaches and methods for the rapid detection and reporting of pollution accidents such as toxic spills were developed. The water-quality systems in use at the Rhine River served as models.

B. Coordination of activities

45. Considerable efforts were made during the preparatory process for the International Conference on Water and the Environment (Dublin, 1992) and the United Nations Conference on Environment and Development (Rio de Janeiro, 1992) towards close cooperation and the elimination of overlaps to the extent possible. The process has been continued since the United Nations Conference on Environment and Development, particularly with a view to bringing hydrology and water-quality sciences close together. Annual meetings of the GEMS/WATER Steering Committee are used to streamline the activities of UNEP, WHO, UNESCO and WMO. In order to formalize such cooperation, a memorandum of understanding between the organizations is in the process of being reviewed and is expected to be finalized during 1994.

46. The Water Supply and Sanitation Collaborative Council held its second meeting in Rabat in September 1993. One of the outcomes was the establishment of a Council-mandated working group on water pollution control designed to bring together agencies of the United Nations system, other international organizations, non-governmental organizations, bilateral donors and developing country representatives of the water sector in a joint effort to curb pollution of water resources.

47. The programmes on water-quality management in international river basins (Nile, Zambezi, Mekong, Rio de la Plata) have led to close technical cooperation between regional authorities, namely, river basin authorities of committees, the bilateral and multilateral donors involved, and various organs of the United Nations system, notably UNEP and WHO.

48. Linkages with professional associations have been established through the International Association on Water Quality. Scientific and technical experts

are members of this group, together with leading professionals of national water agencies. Collaboration is affected through co-sponsored meetings, working groups and training courses.

IV. MITIGATION OF WATER-RELATED NATURAL DISASTERS

49. Within the water resources field and under its Hydrology and Water Resources Programme, WMO continues its efforts in disaster mitigation relating to floods, avalanches, landslides and droughts. Efforts are also being made to promote the use of weather radar for hydrologic forecasting and warning, particularly within Europe. WMO has established two drought-monitoring centres in Africa, one in Nairobi and the other in Harare. Those centres use data collected, in the main, from the Global Telecommunication System of the World Weather Watch to forecast and characterize meteorological drought in eastern and southern Africa.

50. WMO's involvement in the planning for the International Decade for Natural Disaster Reduction has led to several projects' being undertaken especially for the Decade, two of them designed to provide a more comprehensive approach to disasters. The System for Technology Exchange for Natural Disasters (STEND) is modelled on HOMS in order to provide a system for technology transfer for meteorology, oceanography, seismology and volcanology in addition to hydrology. The Comprehensive Risk Assessment Project (CRASH) promotes a comprehensive approach to risk assessment through the use of the Geographical Information System (GIS), remote sensing and seismic hazard studies. Combined risks from storms, floods and earthquakes will be determined for certain target areas.

51. Water-related natural disaster reduction activities have been carried out by ESCAP with the aim of strengthening the disaster preparedness and mitigation capabilities of member countries through provision of technical assistance and training of key personnel in prediction and early warning; risk assessment, hazard mapping and land-use planning; hazard monitoring and damage assessment; selection of appropriate structural and non-structural measures for minimizing risk to lives, property and infrastructure; strengthening or introduction of institutional frameworks for natural disaster preparedness and mitigation; promotion of regional cooperation in natural disaster reduction; and provision of substantive support to such intergovernmental institutions as the Typhoon Committee and the Panel on Tropical Cyclones.

52. During 1993, ESCAP conducted roving seminars on comprehensive flood loss prevention and management in Myanmar, Pakistan, the Islamic Republic of Iran and Solomon Islands.

53. The question of the mitigation of water-related natural disasters, in addition to being closely related to that of the strengthening of natural hydrologic networks for early warning, is also intimately related to that of the planning and management of water resources. In many instances, this is the case in the work of the regional commissions and of the Department for Development Support and Management Services of the United Nations Secretariat. The capacity of countries to deal with issues concerning water-related natural disasters

questions within the planning process and on the availability of timely and reliable information.

V. DRINKING-WATER SUPPLY AND SANITATION

A. General overview of activities

54. Increasingly, the agencies of the United Nations system are developing cooperative programmes and activities with each other. A good example of an activity that is meeting the needs of appropriate technologies and innovative developmental approaches is the UNDP-World Bank Water and Sanitation Programme. In over 10 years of operation, the Programme has undertaken regional and country-level activities aimed at the poor and underserved populations in Africa, Asia and Latin America. The greatest impact of the Programme, however, has been in demonstrating the successful implementation of lower-cost water and sanitation services to the multilateral, bilateral and national agencies with which it cooperates. The current strategy of the Programme is to build capacity at national and local levels, to support sustainable investments, and to disseminate lessons and knowledge.

55. Another example of cooperation is the WHO/United Nations Children's Fund (UNICEF) Joint Monitoring Programme, which has the goal of strengthening or establishing national capabilities for monitoring water supply and sanitation activities. The availability of accurate sector statistics is essential both to the management of water and sanitation programmes at the national level, and to the preparation of country support at the international level. The joint programme of WHO and UNICEF has been well received by countries in the three years it has been in operation, but its ability to respond to their needs has been severely restricted by a shortage of funds and trained personnel.

56. The Inter-Agency Steering Committee for Water Supply and Sanitation has long played a central role among the agencies of the United Nations system. In November 1993, it became a working group of the ACC Subcommittee on Water Resources, with responsibilities for coordinating the implementation of joint drinking-water supply and sanitation activities of the United Nations system. The Steering Committee is intended to perform a catalytic role with regard to the development of joint activities and to establish a network of collaboration among relevant organizations. WHO will continue to provide secretariat services to the Steering Committee, while the chairmanship will rotate annually among UNICEF, UNDP, WHO and the World Bank.

57. A step towards regional cooperation was taken in 1993 when both the Steering Committee and the ACC Subcommittee on Water Resources recognized that the deteriorating water and sanitation situation in Africa required a special inter-agency effort to develop innovative and cooperative water resources programmes to meet the most pressing needs of the region. WHO was assigned responsibility, in consultation with UNDP and ECA and other relevant organizations, to coordinate this effort on behalf of the Subcommittee.

58. Other important inter-agency programmes having water supply and sanitation components include the Joint WHO/FAO/UNEP/United Nations Centre for Human

Settlements (Habitat) Panel of Experts on Environmental Management for Disease Vector Control (PEEM); the UNDP/World Bank/UNEP Urban Management Programme; and the Task Force on Women, in which the Department for Development Support and Management Services of the United Nations Secretariat, INSTRAW, UNICEF and the UNDP/World Bank Water and Sanitation Programme have been cooperating.

59. As follow-up to Agenda 21, a number of activities were set in motion by the ACC Subcommittee on Water Resources. For instance, within the information management working group, the water and sanitation database and software of the WHO/UNICEF Joint Monitoring Programme were reviewed with regard to potential applications in agriculture, rural development and hydrology. In addition, initial steps towards new cooperative programmes in support of Agenda 21 have been taken recently. UNICEF and WHO have begun to develop a joint strategy for hygiene education in water supply and sanitation in the 1990s. Moreover, the UNDP/World Bank Water and Sanitation Programme and WHO are collaborating on hygiene education activities in Africa and Asia. In the case of Latin America and the Caribbean, ECLAC plans to prepare a study on the experiences of the countries of the region concerning the restructuring of the operation of water supply and sanitation companies, including their privatization, with emphasis on the role of tariffs in achieving greater efficiency and effectiveness in the provision of services.

B. Coordination of activities

60. Because of the multifaceted nature of the work of the organizations of the United Nations system and of the importance of the subject, there is inevitably considerable overlapping of responsibilities and activities among them. Since each organization brings a different perspective to its work concerning water supply and sanitation, this overlap is not necessarily deleterious to the overall effectiveness of the system provided the perspectives are tied together within a concerted approach to the issue. In this respect, both the Inter-Agency Steering Committee for Water Supply and Sanitation and the ACC Subcommittee on Water Resources provide the forums through which such harmonization is being actively sought. Nevertheless, further efforts are needed to delineate more clearly the areas of comparative advantage of each organization. Coordination among United Nations agencies in drinking-water supply and sanitation is well developed at the policy level and moderately effective at the programme level. However, it needs strengthening in the case of activities carried out at the national level. With the exception of instances where one organization provides direct support to another in the implementation of a given project or programme, activities and projects of various organizations are too often carried out without due knowledge or consideration of those undertaken by others.

61. The marked influence of the United Nations Conference on Environment and Development and the process leading to it can be seen in recent inter-agency efforts to integrate the various freshwater activities of United Nations organizations into a more comprehensive approach. This was demonstrated at the International Conference on Water and the Environment and in the FAO, UNICEF, UNDP, World Bank and WHO Technical Consultation on Integrated Rural Water Management, held in Rome in March 1993. Also noteworthy is the current series

of regional workshops on health, agriculture and environmental aspects of wastewater reuse being carried out by WHO, FAO, UNEP and the United Nations Centre for Human Settlements (Habitat). Efforts towards finding new forms of cooperation and developing operational activities have resulted in ACC Subcommittee initiatives regarding the preparation of a multilingual glossary of technical terms, the rationalization of water resources monitoring programmes, a review of innovative approaches to African water resources development, and various working groups dealing with advocacy issues, the role of women, and rural and urban development.

62. Coordination and cooperation with external support agencies, non-governmental organizations and scientific and professional organizations are being carried out through the Collaborative Council for Water Supply and Sanitation. Support to the Council is provided individually by the organizations of the United Nations system, and collectively through the Inter-Agency Steering Committee for Water Supply and Sanitation, and through the ACC Subcommittee on Water Resources. The Executive Secretary of the Council provides the links for expanding cooperation between the United Nations organizations and other members of the Collaborative Council.

VI. WATER AND SUSTAINABLE URBAN DEVELOPMENT

A. Overview of activities

63. The main goal of the programme area on "Water and sustainable urban development" of Agenda 21 is contained in section E of chapter 18. In addition, there are complementary activities in that area that are included in other sections of chapter 18 and in other chapters of Agenda 21, especially chapter 7, entitled "Promoting sustainable human settlement development", and chapter 21, entitled "Environmentally sound management of solid wastes and sewage-related issues".

64. As a response to the rapid pace of urbanization in developing countries, the recognition of the fundamental role of cities in the achievement of sustainable social and economic development, and the escalating demands for the improved management of water resources, and water supply, sanitation and drainage in urban areas, most organizations of the United Nations system are giving increasing attention to the execution of activities related to water and sustainable urban development.

65. Some examples of this trend include the UNESCO/WMO initiatives on urban hydrology; the urban water supply and sanitation components of the UNDP-World Bank Water and Sanitation Programme; the growing activities of UNICEF in periurban areas; the inclusion of a special subprogramme to attend to urban problems in the new WHO Enhanced Programme for the Promotion of Environmental Health; and the activities on water resources and urban infrastructure management being implemented by the United Nations Centre for Human Settlements (Habitat) Settlements Infrastructure and Environment Programme, Sustainable Cities Programme, and Urban Management Programme.

66. Notwithstanding the increasing commitment of the organizations to implementing the relevant recommendations contained in Agenda 21, only a limited number of current activities are urban-specific, most of them being part of broader programmes or projects. However, there are some exceptions, particularly in activities related to urban drainage and flood prevention, waste disposal facilities, pollution control, the promotion of public participation, and the building of local capacities for the management of urban water resources.

67. Specific activities in response to Agenda 21 include the introduction of environmental impact assessment for major water resources development projects related to urban areas; the implementation of resource allocation decisions; the development of legal and institutional frameworks and planning mechanisms for the integrated management of urban development and water resources within a watershed; the protection of watersheds from depletion and degradation of their forest cover and from harmful upstream activities; the promotion of public participation for the collection, recycling and elimination of wastes; efforts to mobilize and facilitate the active involvement of women in water management teams; the introduction of water tariffs, where affordable, that reflect the marginal and opportunity cost of water, especially for productive activities; the promotion of the allocation of resources according to economic, social and environmental criteria; and the implementation of urban storm-water run-off and drainage programmes.

68. Other aspects of relevance to the integrated management of water resources and sustainable urban development, such as institutional, legal and management reforms and support to local capacity-building, are covered less extensively, and represent areas where increased efforts will have to be developed in the future. However, there are some innovative approaches being applied by the United Nations Centre for Human Settlements (Habitat) within its Urban Management Programme and its Sustainable Cities Programme in providing municipal authorities and their partners in the public, private, and community sectors with improved planning and management capacity.

69. The activities of the regional commissions, WHO and the UNDP-World Bank Water and Sanitation Programme have strong regional components. ESCAP, in close cooperation with the regional offices of WHO and the World Bank/UNDP Water and Sanitation Programme, held a Regional Seminar on Water Resources Management in Urban Areas, from 22 to 26 November 1993. National activities in support of sector monitoring and assessment are also executed by the World Bank, UNICEF and WHO.

B. Coordination of activities

70. As was stated under section V concerning water supply and sanitation, each of the organizations of the United Nations system implement activities in the area of water and sustainable urban development from the perspective of its own thematic specialization. Given the nature of those activities, it is natural that some overlapping takes place in the execution of both global and local programmes and projects.

71. The ACC Subcommittee on Water Resources provides a mechanism for harmonizing the activities of the various United Nations organizations within this field. The annual meetings of the Subcommittee and continuous consultation among its member agencies have allowed a relatively high degree of coordination of the tasks and global activities of the organizations of the United Nations system in this area. The Subcommittee has established a task force under the chairmanship of the United Nations Centre for Human Settlements (Habitat) which is entrusted with the task of recommending options for inter-agency collaboration in implementing follow-up activities on urban water resources issues stemming from Agenda 21. The working group will examine priority issues concerning the provision of external support to developing countries, alternatives for the delivery of such support, and the scope and nature of future inter-agency collaborative activities.

72. The largest area of current collaborative activities concerns the relationship between a funding organization and one or more implementing agencies. The UNDP-World Bank agreement for the execution of the Water and Sanitation Programme falls into this category, as do the ad hoc agreements between UNDP and several executing agencies (the Department for Development Support and Management Services of the United Nations Secretariat and the United Nations Centre for Human Settlements (Habitat), UNICEF, and so on) for the implementation of technical assistance projects. In addition, there are also cases of inter-agency joint funding or shared provision of regular inputs to a particular project or programme, such as the UNICEF-WHO agreement for the implementation of the Water and Sanitation Monitoring Programme; UNEP-WHO collaboration in the GEMS/water programme; the activities of the Panel of Experts on Environmental Management for Disease Vector Control involving the joint participation of UNEP, WHO, FAO and the United Nations Centre for Human Settlements (Habitat); and the United Nations Centre for Human Settlements (Habitat)-UNDP-World Bank Urban Management Programme.

73. Despite the present experience in inter-agency collaboration, the number of collaborative "events" is still small in relation to the overall number of potential joint activities that could be implemented by the organizations of the United Nations system. Thus, additional efforts will need to be made for the design and implementation of a coherent policy for joint programming and collaborative execution based on the mandates and comparative capacities of each organization. As in the case of water supply and sanitation in general, the harmonization of tasks in the implementation of national and local activities demands a greater effort of coordination owing to the need to satisfy diverse requirements from national authorities and funding sources, and to take into account the relative strengths of the various organizations in a particular country.

74. The regional commissions, notably ECLAC and ESCAP, have been active in the promotion of water resources management in the urban setting. Unfortunately, however, the lack of consistent participation at the sessions of the Inter-Agency Steering Committee for Water Supply and Sanitation and the ACC Subcommittee on Water Resources has severely limited the opportunities for integration of their programmes within overall approaches to issues concerning urban development. In the case of ESCAP and ECA, however, opportunities for

harmonization at the regional level are provided through their respective regional inter-agency mechanisms.

75. The Water Supply and Sanitation Collaborative Council represents the main mechanisms for the coordination of overall policies and programmes of United Nations organizations with non-governmental organizations, bilateral organizations and other external support agencies. The Council established a working group on urbanization at its meeting in Oslo in 1991. The working group was entrusted with the task of developing a strategy for the improved provision of services to urban areas. The activities of the working group are currently being continued through the Council's mandated activity in the area of "services for the urban poor".

76. Given the rapid pace of urbanization in developing countries and the increasing competition for water between urban and agricultural uses, there is a need to ensure that approaches to water resources development for urban uses are fully integrated within inter-agency strategies for integrated water resources management for sustainable development.

VII. WATER FOR SUSTAINABLE FOOD PRODUCTION AND RURAL DEVELOPMENT

A. Overview of activities

77. Activities relating to water for sustainable food production and rural development encompass a wide array of activities that go beyond agricultural water use. In addition to typical agricultural water management activities, the programme area includes rural water supply and sanitation, environmental management for control of water-borne diseases, and the treatment, reuse and disposal of waste water, to mention a few. Thus, it is basically an integrated approach to rural water management, which necessitates interdisciplinary and inter-agency efforts for implementing the programmes at local, national, regional and global levels. With this in mind, and to establish broad guidelines for implementing the programme, a Technical Consultation on this subject was convened by FAO in March 1993, in close collaboration with UNICEF, UNDP, the World Bank and WHO. This Consultation has produced broad guidelines for programme implementation and a number of specific recommendations for action. The proceedings of this Consultation have been published and are being widely distributed.

78. The Consultation recognized that while urbanization was growing rapidly, most of the low-income countries were still primarily rural, and rural areas hosted the greatest share of the poor. Many lack the most essential elements for day-to-day life, including fresh water, and it is in the rural areas that poverty and environmental degradation come together most acutely. It was agreed that initiatives must be taken in support of policy reviews, reform and formulation at the national level with specific regard to the rural environment. Attention should be given to the preparation of suitable guidelines, approaches and methodologies for this purpose, leading to the strengthening of mechanisms for intersectoral coordination, and to the creation of appropriate legal and institutional structures for the implementation of national water management and

conservation policies. The Consultation recommended that support be given to Governments in information management and the building of information systems for the collection and analysis of data. A suggestion was made for the enhancement or establishment of "information system centres" at the national level as a component of this activity. In response to this, FAO has launched a programme called the "Global water information system" which will create national and global water resources and rural water use databases.

79. The Consultation approved a short list of four areas worthy of research, namely, (a) river basin management; (b) water use efficiency; (c) waste-water management; and (d) optimization of system performance. Because of the diverse characteristics involved, each was considered in turn, and recommendations were formulated individually.

80. The Consultation emphasized the importance of National Water Sector Assessments that had already been initiated under the programme area of integrated water resources management as a starting-point for the identification of capacity-building needs and priorities. A country assessment is the first step in the definition of capacity-building programmes. In addition, it recommended that national Governments and support agencies enter into long-term commitments to facilitate programmes for capacity-building, which must be seen as a steady and continuing process, with relatively small inputs over a long period of time to be considered more effective than larger inputs of short duration. It further recommended that opportunities should be taken for the networking of institutions, which was a powerful tool for capacity-building, and in particular, for the exchange of experiences and capacities between developing countries.

81. The need to develop a landscape and river basin framework for integrated rural water resources management was recognized by the Technical Consultation, which recommended that such a framework should take into account issues concerning the coordination of upstream and downstream aspects of water management; the integration of multiple uses of water including irrigation, drainage and aquaculture; and the consideration of the interrelationships among livestock, rural and urban domestic water use, and industrial and hydropower water use.

82. An informal consultation is scheduled to be held in Rome from 31 January to 2 February 1994, in direct response to the request of the Committee on Natural Resources, on "Land/water linkages and river basin management". It will be held under the joint sponsorship of FAO and the Natural Resources Management Institute of the University of Stockholm.

83. The informal consultation is designed to address the broader issues of water management in the context of land use and environment, taking into account the distinct zones from upper catchment to base levels within a river basin, with a view to defining land and water linkages; development of a conceptual framework to predict land/water/environment interactions; establishment of a landscape and river basin approach to integrated land and water resources management including aspects of scaling; and drafting of a programme of action including strategies and models (physical, mathematical and computer

simulation/optimization) for integrated water/land management on a landscape and/or river basin basis.

84. Within FAO, high priority is given to the implementation of the relevant recommendations and programmes contained in Agenda 21. In this context, a number of special action programmes are being established. One such special action programme is that on Rural Water Resources for Sustainable Agricultural Development (SAP-WASAD), which is complementary to the ongoing inter-agency International Action Programme on Water and Sustainable Agricultural Development. The objective of SAP-WASAD is to promote a stronger interdisciplinary approach to water management within agriculture, forestry and the fisheries subsectors under the FAO International Cooperative Programme Framework for Sustainable Agricultural and Rural Development (related to chap. 14 of Agenda 21).

85. SAP-WASAD encompasses action at three levels. At the scheme and village level, the focus will be on improving water use efficiency through the introduction of new technologies, community participation and institutional strengthening. At the provincial level, the Programme will assist in formulating policies and strategies for implementing provincial programmes for efficient and multiple use of water (drinking and sanitation, crops, livestock, fish and agroforestry), soil and water conservation and environmental protection. At national and river basin levels, the programme will assist developing countries in the formulation of policies, strategies and legislation for fair allocation of water resources within the framework of national and river basin-water master plans, and in the application of demand management principles through economic, social, political and technical instruments.

86. The International Action Programme on Water and Sustainable Agricultural Development (IAP-WASAD), which was initiated in 1991, focuses action at national, subregional and regional levels. Its goal is to assist member countries in meeting their freshwater needs for sustainable agriculture and rural development through the formulation and implementation of action programmes at country, subregional and regional levels, in partnership with relevant United Nations organizations and multilateral and bilateral donor agencies. To date, national and subregional action programmes have been formulated in Egypt, Indonesia, Mexico, the Syrian Arab Republic, Turkey, the United Republic of Tanzania, Zimbabwe and the Lake Chad basin. Activities are being initiated in Egypt, Indonesia and Turkey towards the implementation of their respective programmes.

87. Comprehensive rural water-supply programmes, based on village-level management and maintenance, are being carried out in many Sahelian countries by the Department for Development Support and Management Services of the United Nations Secretariat with funding from UNDP and the United Nations Capital Development Fund (UNCDF). There has also been some cooperative action, in the Niger and in Guinea-Bissau, between the Department for Development Support and Management Services of the United Nations Secretariat and UNICEF and the World Bank/UNDP joint programme for the Promotion of the Role of Women in Water and Environmental Sanitation Services (PROWWESS).

B. Coordination of activities

88. The IAP-WASAD programme has benefited from a good degree of national and international cooperation. In all national and subregional programmes, there was involvement of a number of ministries (core ministries include agriculture, water resources and environment ministries and, in a few cases, health ministries) and national institutions. The action programme formulation mission has always included national consultants and the active participation of national counterparts, and quite often local non-governmental organizations were involved. Consultations were always held with resident staff of the relevant United Nations system organizations and donor countries.

89. At the headquarters level of United Nations organizations, a good degree of collaboration was achieved through the ACC Subcommittee on Water Resources. As work in the formulation of concerted approaches to integrated water resources management progresses, a close interrelationship will need to be developed between those approaches and the development of water resources for sustainable food production and rural development. Certain missions were undertaken in collaboration with consultants and/or staff funded by WHO, the Department for Development Support and Management Services of the United Nations Secretariat, UNDP and UNEP. Donors such as the Canadian International Development Agency (CIDA) (Canada), the Japanese Agricultural Land Development Agency (JALDA) (Japan) and the United States Agency for International Development (USAID) (United States of America) have shared part of the expenses of some of those missions.

90. The missions collaborate very closely with the FAO Forestry and Fisheries departments. With the establishment of the Special Action Programme within FAO, interdivisional and interdepartmental collaboration is being further strengthened within FAO.

VIII. CONCLUSIONS

91. The concept of coordination and cooperation among the organizations of the United Nations system has undergone a significant evolution since the 1960s and particularly since the United Nations Water Conference, held in 1977 at Mar del Plata, Argentina. Initially coordination was seen as a process of delineation of spheres of influence among competing organizations, and debates were often acrimonious as to which organization should be called upon to perform which task. Following the conference at Mar del Plata, a gradual understanding emerged as to the inevitability of the existence of grey areas, and the need to manage overlaps and duplications. In more recent years the understanding of the concept of cooperation grew further, into an appreciation of the importance of bringing about concerted approaches and policies with respect to the formulation and implementation of activities in specific programme areas. This, perhaps, was most evident with regard to coordination and cooperation in the context of the International Drinking Water Supply and Sanitation Decade in the 1980s.

92. The monitoring of progress in the implementation of the Mar del Plata Action Plan, and the process leading to the International Conference on Water and the Environment in Dublin and to the United Nations Conference on

Environment and Development have yielded further understanding of the need to take a more comprehensive approach to water resources. The process of coordination and cooperation is now entering a stage characterized by an increasing appreciation of the importance of taking a holistic and comprehensive approach to land and water resources development where no one programme area can proceed without referring to the requirements of others, or to overall economic and social priorities. Consequently, there is now a growing understanding of the need to formulate concerted approaches to integrated water resources development and management, which in turn should provide an overall umbrella for coordination and cooperation.

93. Recent advances in communication through electronic means are facilitating the exchange of information among organizations of the United Nations system. Nevertheless, successful coordination and cooperation still require frequent encounters between the parties concerned through a variety of inter-agency meetings and seminars on specific issues. There is no linear functional relationship between expenditures and achievements in the field of coordination. Meetings of various kinds may have immediate results in the implementation of joint activities. Results, however, are not always immediately tangible, as the evolution of new concepts and approaches usually requires a wider time-frame.

94. The failure to appreciate the long-term value of coordination programmes leads to insularity among organizations and to a diminution of the overall capacity of the United Nations system. In this regard, the various coordination efforts being carried out throughout the system and particularly through the ACC Subcommittee on Water Resources need to benefit from the regular participation of the regional commissions.

95. As is the case for the ACC itself and all other parts of its subsidiary machinery, the ACC Subcommittee on Water Resources remains a forum open only to the organizations of the United Nations system. Nevertheless, contacts with external support agencies, non-governmental organizations and professional and scientific organizations take place via the Subcommittee's working groups, as well as through seminars, symposia and technical consultations convened by the various organizations. The most permanent and systematic forum for a wide dialogue among all the organizations concerned is to be found in the Collaborative Council for Water Supply and Sanitation, which meets every two years and has a small secretariat based at WHO headquarters. Regarding the formulation of concerted approaches to integrated management of freshwater resources, the need for further dialogue still remains.

Notes

1/ Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992, vol. I, Resolutions Adopted by the Conference (United Nations publication, Sales No. E.93.I.8 and corrigendum), resolution 1, annex II.

2/ Washington, D.C., International Bank for Reconstruction and Development/World Bank, 1993.

3/ Report on Water Resources Assessment: Progress on the Implementation of the Mar del Plata Action Plan and Strategy for the 1990s (WMO/UNESCO, 1991).

4/ Report of the United Nations Water Conference, Mar del Plata, 14-25 March 1977 (United Nations publication, Sales No. E.77.II.A.12), chap. I.